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# PTU300 Combined Pressure, Humidity and Temperature Transmitter for Industrial Use



*The Vaisala Combined Pressure, Humidity and Temperature Transmitter PTU300 is a versatile, multi-purpose instrument.*

## Features/Benefits

- Barometric pressure, humidity and temperature measurement in one transmitter
- Available with two barometric pressure sensors - for added realibility
- RS-232C serial interface with NMEA protocol for GPS use
- Optional display, RS-485, analog output, and relay
- Optional power supply module
- NIST traceable calibration
- HMT330MIK Installation kit for outdoor use
- Applications include environmental monitoring in calibration laboratories, GPS meteorology: estimating precipitable water vapor in the atmosphere; weather stations

## One transmitter, three measurements

The Vaisala Combined Pressure, Humidity and Temperature Transmitter PTU300 measures barometric pressure in two accuracy classes, humidity, and temperature.

You can choose which probe best suits your needs: PTU301 for laboratories, PTU303 for outdoor use, the warmed PTU307 probe for demanding meteorology, and PTU30T for pressure and temperature only.

## Vaisala proven sensor technology

The PTU300 transmitter uses sensors known for their high accuracy and excellent long-term stability: the Vaisala BAROCAP® is used for pressure measurement and the Vaisala HUMICAP® for humidity measurement. The temperature sensor is a platinum RTD sensor.

## Graphical trend display

The PTU300 series features a large numerical and graphical display, allowing users to easily monitor operational data, measurement trends and 1-year measurement history.

## Data collection and transfer to PC

The recorded measurement data can be viewed on the display or transferred to a PC with Microsoft Windows® software. A USB-RJ45 cable makes it easy to connect the PTU300 to a PC.
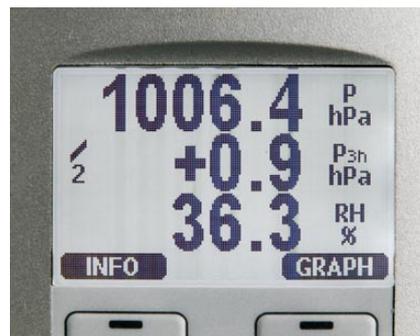
## Flexible calibration

A quick, one-point field calibration for humidity can easily be done using the Vaisala Hand-Held Humidity Meter HM70.



*The display also shows the WMO pressure trend ΔP 3h and tendency of 0 ... 9.*

## Serial communication

The PTU300 comes with a standard RS-232 serial interface. The output format is compatible with major GPS receivers and NMEA coded messages. RS-485 is available as an option.
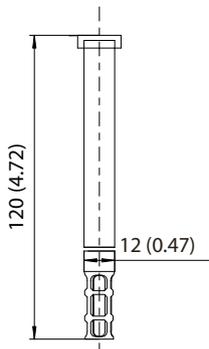
## Outdoor installation kit

The optional HMT330MIK Installation Kit is available for outdoor installation. It provides reliable measurements for meteorological purposes.
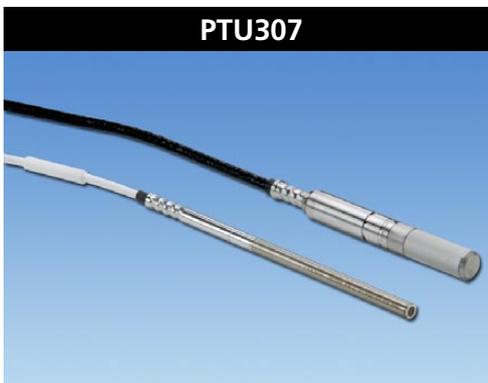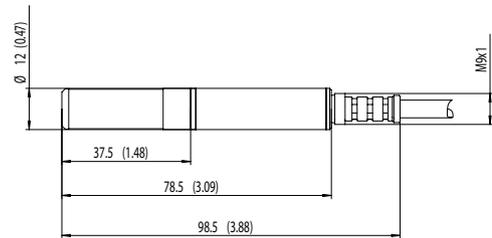
## PTU301



For wall-mounting



120 (4.72)

12 (0.47)

## PTU303



For outdoor use and tight spaces.



Ø 12 (0.47)

M9x1

37.5 (1.48)

78.5 (3.09)

98.5 (3.88)

## PTU307



A warmed probe for demanding meteorological measurements.



Ø 12 (0.47)

M9×1

37.5 (1.48)

79.5 (3.13)

99.5 (3.92)

Ø 6 (0.24)

130 (5.12)

## PTU30T
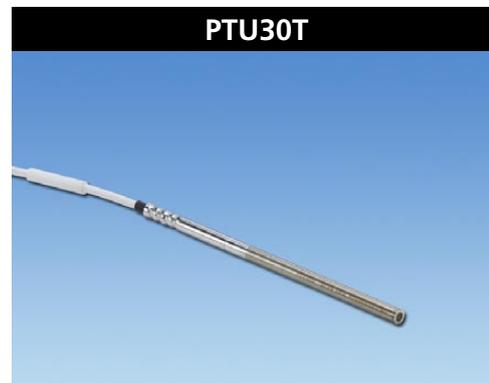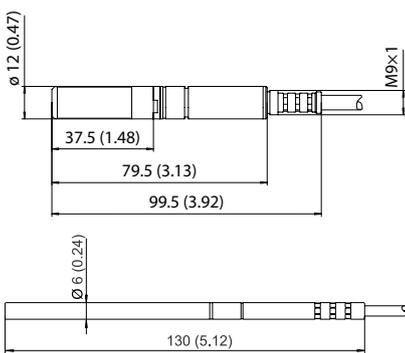


For measuring temperature only.



Ø 6 (0.24)

130 (5.12)
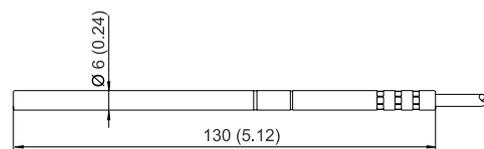
# Technical Data, Dimensions

## Performance

**Barometric pressure**

Pressure range    500 ... 1100 hPa, 50 ... 1100 hPa

| Accuracy | 500 ... 1100 hPa | 500 ... 1100 hPa | 50 ... 1100 hPa |
|---|---|---|---|
| | **Class A** | **Class B** | |
| Linearity | ±0.05 hPa | ±0.10 hPa | ±0.20 hPa |
| Hysteresis* | ±0.03 hPa | ±0.03 hPa | ±0.08 hPa |
| Repeatability* | ±0.03 hPa | ±0.03 hPa | ±0.08 hPa |
| Calibration uncertainty** | ±0.07 hPa | ±0.15 hPa | ±0.20 hPa |
| Accuracy at +20 °C*** | ±0.10 hPa | ±0.20 hPa | ±0.30 hPa |
| Temperature dependence**** | ±0.1 hPa | ±0.1 hPa | ±0.3 hPa |
| Total accuracy | | | |
| (-40 ... +60 °C/-40 ... +140 °F) | ±0.15 hPa | ±0.25 hPa | ±0.45 hPa |
| Long-term stability/year | ±0.1 hPa | ±0.1 hPa | ±0.2 hPa |
| Response time (100 % response) | | | |
| one sensor | 2 s• | 1 s• | 1 s• |

Pressure units    hPa, mbar, kPa, Pa, inHg, mmH20, mmHg, torr, psia

\*   Defined as ±2 standard deviation limits of endpoint non-linearity, hysteresis error or repeatability error and calibration.

\*\*   Defined as ±2 standard deviation limits of accuracy of the working standard including traceability to NIST.

\*\*\*   Defined as the root sum of the squares (RSS) of endpoint non-linearity, hysteresis error, repeatability error and calibration uncertainty at room temperature.

\*\*\*\* Defined as ±2 standard deviation limits of temperature dependence over

**Temperature**

| | |
|---|---|
| Measurement range, all probes | -40 ... +60 °C (-40 ... +140 °F) |
| Accuracy at +20 °C (+68 °F) | ± 0.2 °C (± 0.4 °F) |
| Temperature units | °C, °F |

**Accuracy over temperature range**
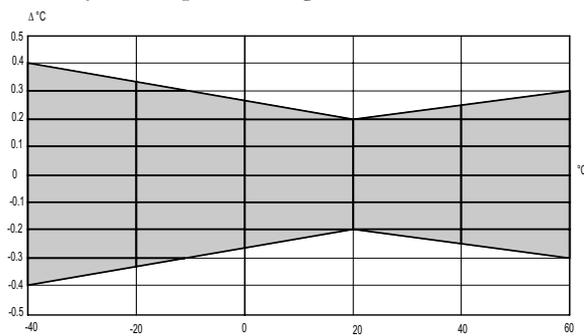


| | |
|---|---|
| Temperature sensor | PT100 RTD 1/3 Class B IEC 751 |

**Relative humidity**

| | |
|---|---|
| Measurement range | 0 ... 100 % RH |

Accuracy (including non-linearity, hysteresis, and repeatability

| | |
|---|---|
| at +15 ... +25 °C | ±1 %RH (0 ... 90 % RH) |
| | ±1.7 %RH (90 ... 100 %RH) |
| at -20 ... +40 °C | ±(1.0 + 0.008 x reading) %RH |
| at -40 ... +60 °C | ±(1.5 + 0.015 x reading) %RH |

Factory calibration uncertainty (+20 °C )

| | |
|---|---|
| (Defined as ±2 standard deviation | ± 0.6 % RH (0 ... 40 %RH) |
| limits. Small variations possible, | ± 1.0 % RH (40 ... 97 %RH) |
| see also calibration certificate.) | |

Sensor

| | |
|---|---|
| for typical applications | Vaisala HUMICAP® 180 or 180R |
| for applications with chemical purge/warmed probe | Vaisala HUMICAP® 180C or 180RC |

Response time (90 %) at +20 °C in still air

| | |
|---|---|
| with grid filter | 8 s / 17 s* |
| with grid + steel netting filter | 20 s / 50 s* |
| with sinterd filter | 40 s / 60 s* |

\* with HUMICAP® 180R or 180RC sensor

## Operating Environment

| | |
|---|---|
| Operating temperature | -40 ... +60 °C (-40 ... +140 °F) |
| with display | 0 ... +60 °C (+32 ... +140 °F) |
| Humidity range | non-condensing |
| Electromagnetic compatibility | EN61326-1:1997 + Am1:1998 |
| | +Am2:2001; Industrial Environment |

## Inputs and outputs

| | |
|---|---|
| Operating voltage | 10 ... 35 VDC, 24 VAC |
| with optional power supply module | 100 ... 240 VAC, 50/60 Hz |

Power consumption at +20 °C ($U_{in}$ 24 VDC)

| | |
|---|---|
| RS-232 | max. 28 mA |
| $U_{out}$ 3 x 0 ... 1 V/0 ... 5 V/0 ... 10 V | max. 33 mA |
| $I_{out}$ 3 x 0 ... 20 mA | max. 63 mA |
| display and backlight | +20 mA |
| during chemical purge | max. +110 mA |
| during probe heating (HMT337) | +120 mA |

Settling time at power-up (one sensor)

| | |
|---|---|
| class A | 4 s |
| class B | 3 s |

External loads

| | |
|---|---|
| current outputs | $R_L$ < 500 ohm |
| 0 ... 1 V output | $R_L$ > 2 kohm |
| 0 ... 5 V and 0 ... 10 V outputs | $R_L$ > 10 kohm |
| Recommended wire size | 0.5 mm² (AWG 20) stranded wires |
| Digital outputs | RS-232, RS-485 (optional) |
| Service connection | RS-232, USB |
| Relay outputs (optional) | 0.5 A, 250 VAC |
| Display | LCD with backlight, graphic trend display of any parameter |
| Menu languages | English, Finnish, French, German, Japanese, Chinese, Spanish, Swedish, Russian |

Analog outputs (optional)

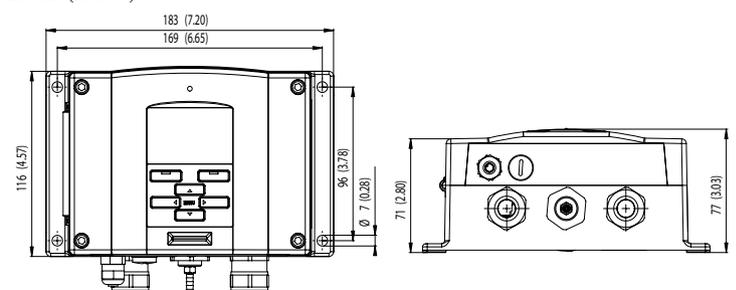| | | |
|---|---|---|
| current output | 0 ... 20 mA, | 4 ... 20 mA |
| voltage output | 0 ... 1 V, 0 ... 5 V, 0 ... 10 V | |
| Humidity and temperature | | |
| accuracy at +20 °C | ±0.05% full scale | |
| temperature dependence | ±0.005%/°C full scale | |
| Pressure | 500...1100 hPa | 50...1100 hPa |
| accuracy at +20 °C | ±0.30 hPa | ±0.40 hPa |
| accuracy at -40 ... +60 °C | ±0.60 hPa | ±0.75 hPa |

## Mechanics

| | |
|---|---|
| Cable bushing | M20 x 1.5 for cable diameter 8 ... 11 mm/0.31 ... 0.43" |
| Conduit fitting | 1/2" NPT |
| User cable connector (optional) | M12 series 8-pin (male) |
| option 1 | female plug with 5 m (16.4 ft) black cable |
| option 2 | female plug with screw terminals |
| Probe cable diameter | |
| PTU303 | 6.0 mm |
| other probes | 5.5 mm |
| Housing material | G-AlSi 10 Mg (DIN 1725) |
| Housing classification | IP 65 (NEMA 4) |
| Weight of PTU303 with 2-m cable | 1.1 kg |

## Accessories

| | |
|---|---|
| PC software and cable | 215005 |
| USB-RJ45 Serial Connection Cable | 219685 |
| Connection cable for HM70 | 211339 |
| Wall mounting plate (plastic) | 214829 |
| Pole installation kit | 215108 |
| Rain shield | 215109 |
| DIN rail installation set | 211477 |
| Duct installation kit, PTU303/307 | 210697 |
| Cable gland and AGRO, PTU303/307 | HMP247CG |
| Solar radiation shield, PTU303/307/30T | DTR502B |
| Meteorological installation kit | HMT330MIK |
| Duct installation kit (T probe) | 215003 |

## Dimensions

in mm (inches)